PSE_Bloch_law_plot

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Import the Data and organize them

First we import the data of each tasks for one participant and each r library that we need.

```
library(readr)
library(ggplot2)
library(dplyr)
```

```
##
## Attachement du package : 'dplyr'
```

```
## Les objets suivants sont masqués depuis 'package:stats':
##
##     filter, lag
```

```
## Les objets suivants sont masqués depuis 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(ggrepel)

#Change the number xx_faces_discr/BL_faces_xx_data_table.csv" and re-run all chunck to see the plot of



contr_landscape <- read_csv("/home/ruiz/Documents/Stage_brxl/DATA_BOCH_LAW/PSE/subj_01_bloch_law_landsca
```

```
## Rows: 500 Columns: 18
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr  (4): subj, contrast_ref, stimulus_filename, reference_filename
## dbl (14): trial_n, current_staircase, duration_test, duration_ref, contrast_...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
contr_faces <- read_csv("/home/ruiz/Documents/Stage_brxl/DATA_BOCH_LAW/PSE/subj_01_bloch_law_faces_PSE/
```

```
## Rows: 500 Columns: 18
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr  (4): subj, contrast_ref, stimulus_filename, reference_filename
## dbl (14): trial_n, current_staircase, duration_test, duration_ref, contrast_...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```r
contr_objects <- read_csv("/home/ruiz/Documents/Stage_brxl/DATA_BOCH_LAW/PSE/subj_01_bloch_law_objects_
```

```
## Rows: 500 Columns: 18
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr  (4): subj, contrast_ref, stimulus_filename, reference_filename
## dbl (14): trial_n, current_staircase, duration_test, duration_ref, contrast_...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```r
# we use head to check if each data set are imported properly.
head(contr_objects)
```

```
## # A tibble: 6 x 18
##   subj  trial_n current_staircase duration_test duration_ref contrast_test
##   <chr>   <dbl>             <dbl>         <dbl>        <dbl>         <dbl>
## 1 01          1                 3          1623         5000            50
## 2 01          2                 4          2924         5000            50
## 3 01          3                10        100000         5000            50
## 4 01          4                 1           500         5000            50
## 5 01          5                 3          1623         5000            74
## 6 01          6                 9         55505         5000            50
## # i 12 more variables: contrast_ref <chr>, stimulus_type <dbl>,
## #   reference_type <dbl>, stimulus_filename <chr>, reference_filename <chr>,
## #   ref_test_order <dbl>, RT <dbl>, resp <dbl>, updated_threshold <dbl>,
## #   updated_slope <dbl>, updated_lapse <dbl>, updated_guess <dbl>
```

```r
head(contr_faces)
```

```
## # A tibble: 6 x 18
##   subj  trial_n current_staircase duration_test duration_ref contrast_test
##   <chr>   <dbl>             <dbl>         <dbl>        <dbl>         <dbl>
## 1 01          1                 4          2924         5000            50
## 2 01          2                10        100000         5000            50
## 3 01          3                 4          2924         5000            26
## 4 01          4                 7         17100         5000            50
## 5 01          5                 2           901         5000            50
## 6 01          6                 4          2924         5000            13
## # i 12 more variables: contrast_ref <chr>, stimulus_type <dbl>,
## #   reference_type <dbl>, stimulus_filename <chr>, reference_filename <chr>,
## #   ref_test_order <dbl>, RT <dbl>, resp <dbl>, updated_threshold <dbl>,
## #   updated_slope <dbl>, updated_lapse <dbl>, updated_guess <dbl>
```

```r
head(contr_landscape)
```

```
## # A tibble: 6 x 18
##   subj  trial_n current_staircase duration_test duration_ref contrast_test
##   <chr>   <dbl>             <dbl>         <dbl>        <dbl>         <dbl>
## 1 01          1                 5          5268         5000            50
## 2 01          2                 9         55505         5000            50
## 3 01          3                 9         55505         5000            26
## 4 01          4                 9         55505         5000            13
## 5 01          5                 4          2924         5000            50
## 6 01          6                 7         17100         5000            50
## # i 12 more variables: contrast_ref <chr>, stimulus_type <dbl>,
```

```
## #   reference_type <dbl>, stimulus_filename <chr>, reference_filename <chr>,
## #   ref_test_order <dbl>, RT <dbl>, resp <dbl>, updated_threshold <dbl>,
## #   updated_slope <dbl>, updated_lapse <dbl>, updated_guess <dbl>
```

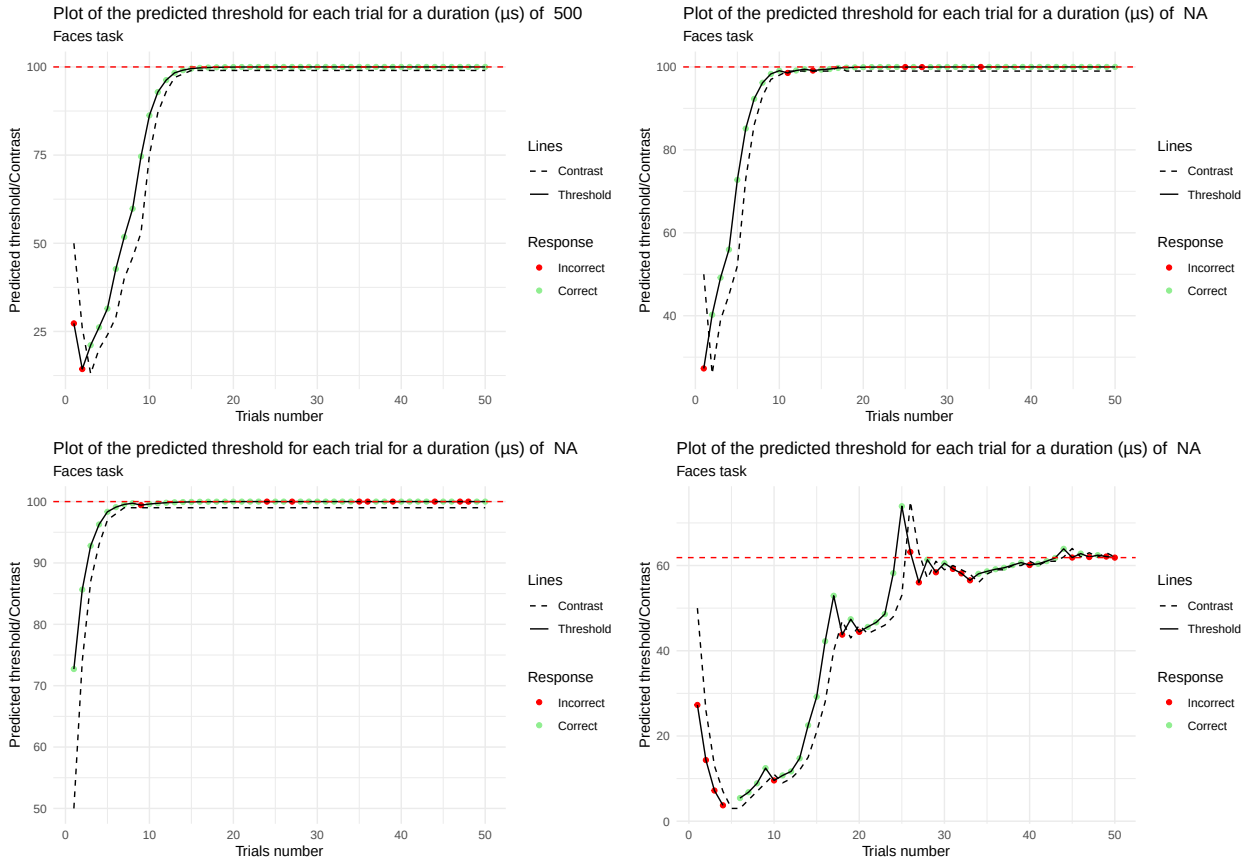
Dividing the data frames into subsets

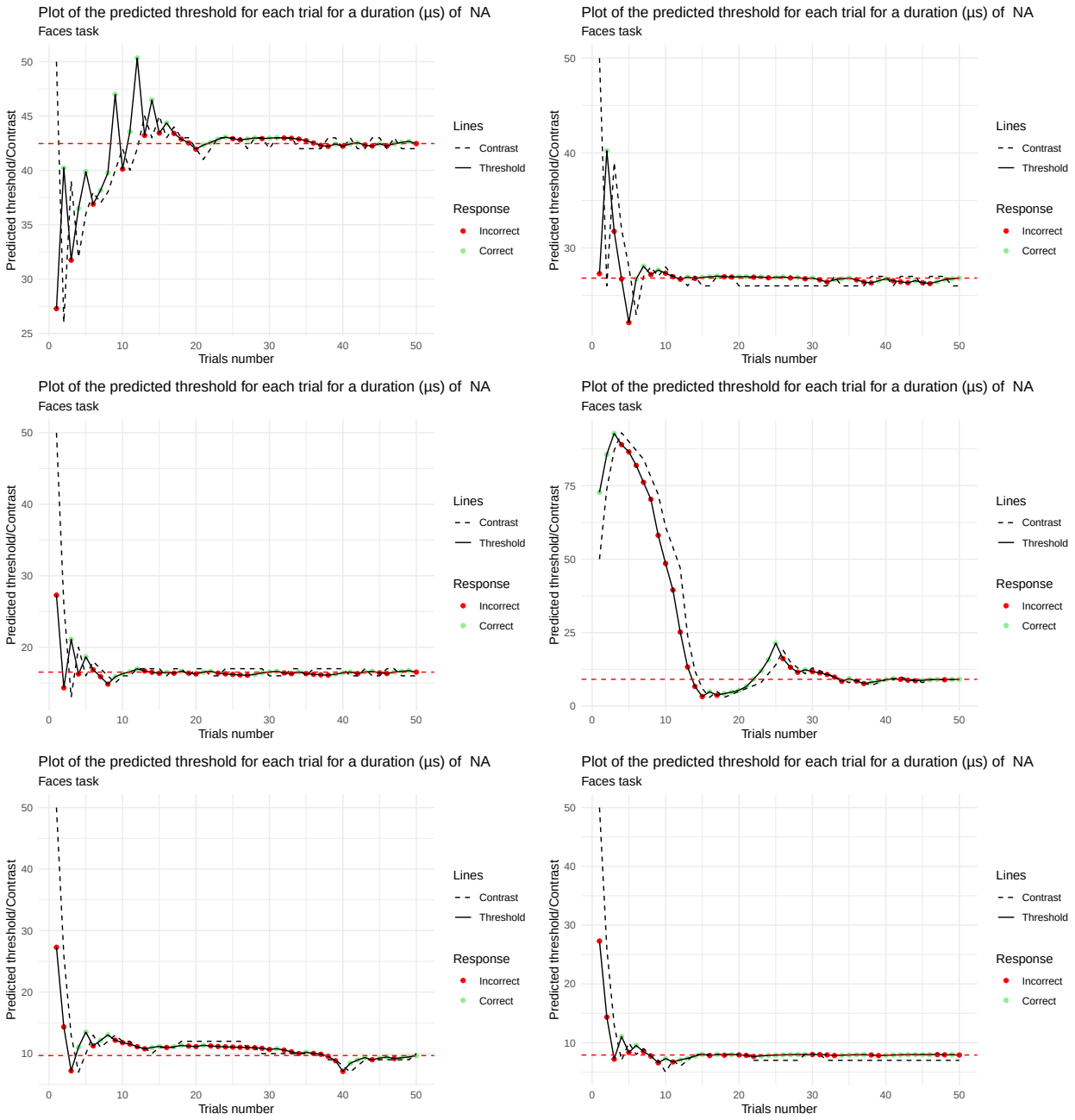
We divide the three data frames into subsets for eachs 10 durations and we extract the final threshold for each of theses durations and we also extract the final contrast for each of theses durations.

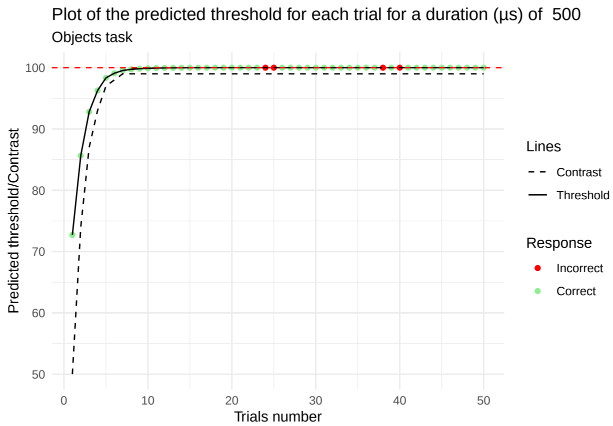
Stairs plots

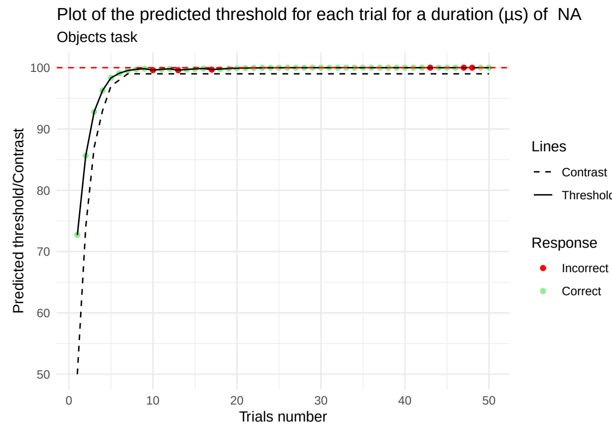
Now we create plot of updated threshold for each trials of each duration to see if the algorithm is working. If it worked we should see stair like plot that converge to a certain value at the 50th trials. If we dont see any stair shape it mean that it didn't work properly, and if the value to which the updated threshold converge is 100 or > 99 it mean that we can't find the "true" threshold wihin our contrasts range. So theses value will be filtered later.

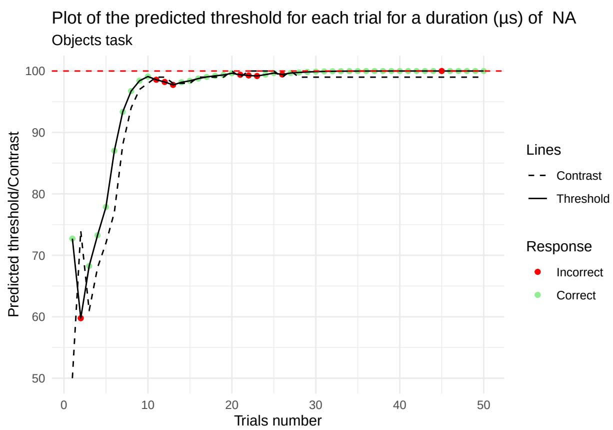
```
## Warning: Removed 1 row containing missing values or values outside the scale range
## (`geom_point()`).
## Removed 1 row containing missing values or values outside the scale range
## (`geom_point()`).
## Removed 1 row containing missing values or values outside the scale range
## (`geom_point()`).
## Removed 1 row containing missing values or values outside the scale range
## (`geom_point()`).
```

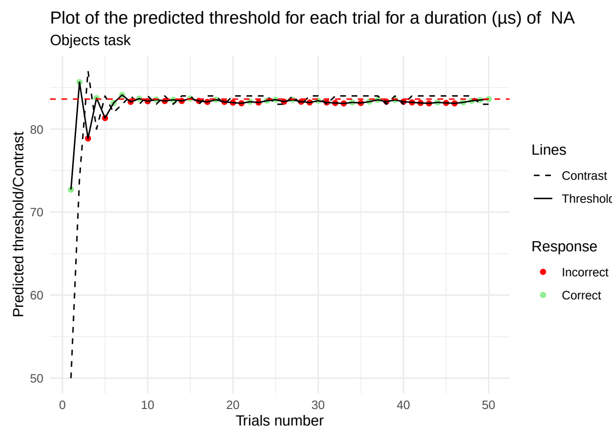


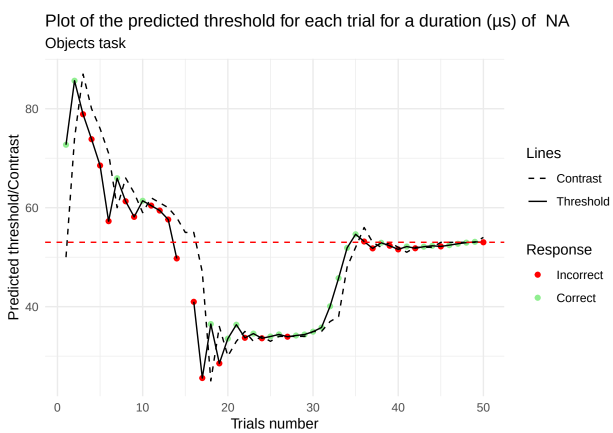

Plot of the predicted threshold for each trial for a duration (µs) of NA
Faces task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

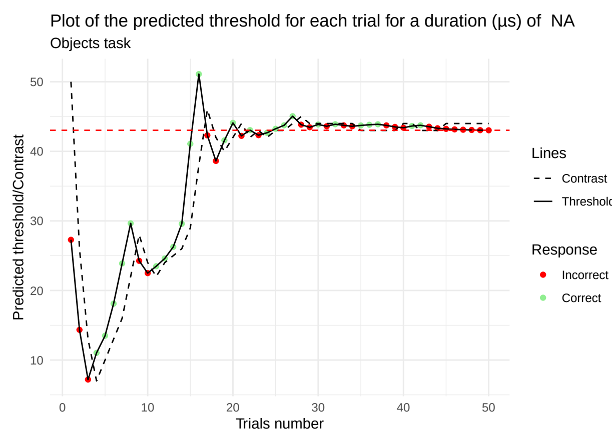

Plot of the predicted threshold for each trial for a duration (µs) of 500
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

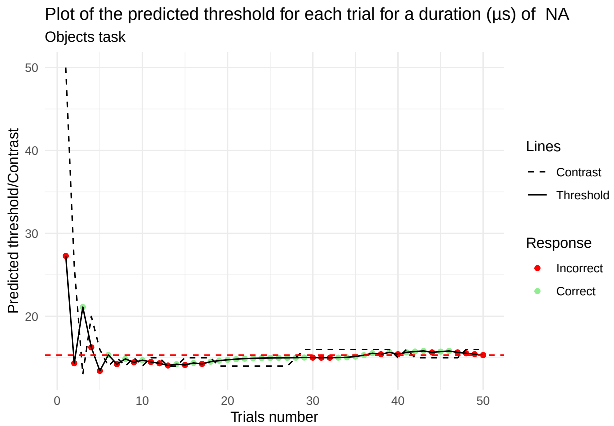

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

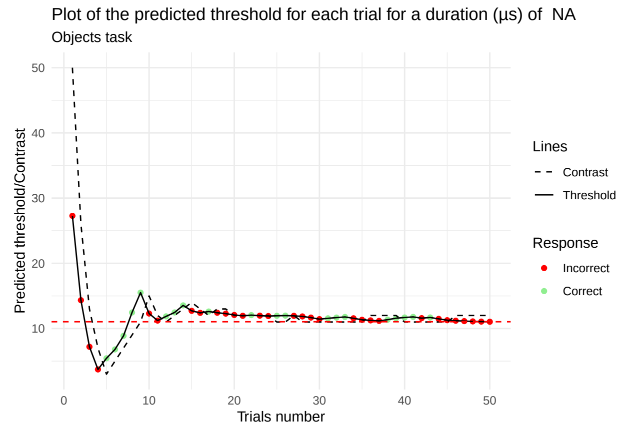

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

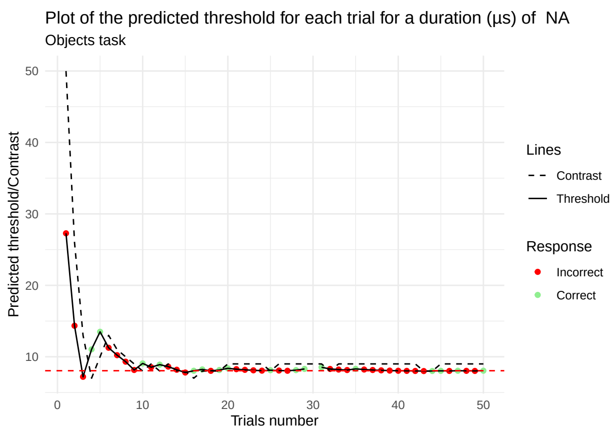

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

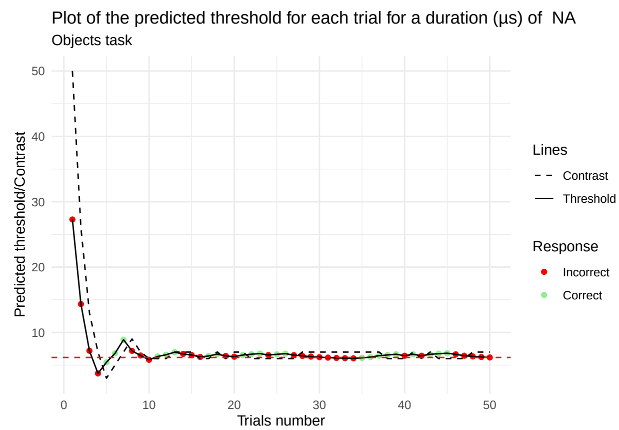

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

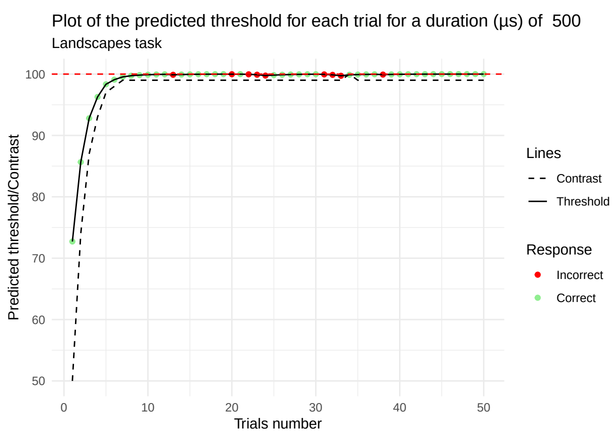

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

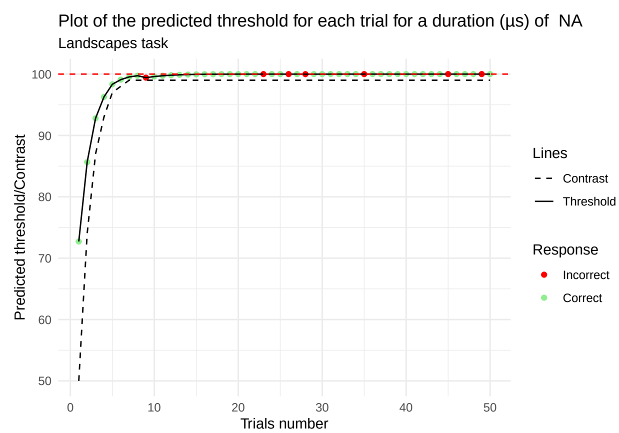

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

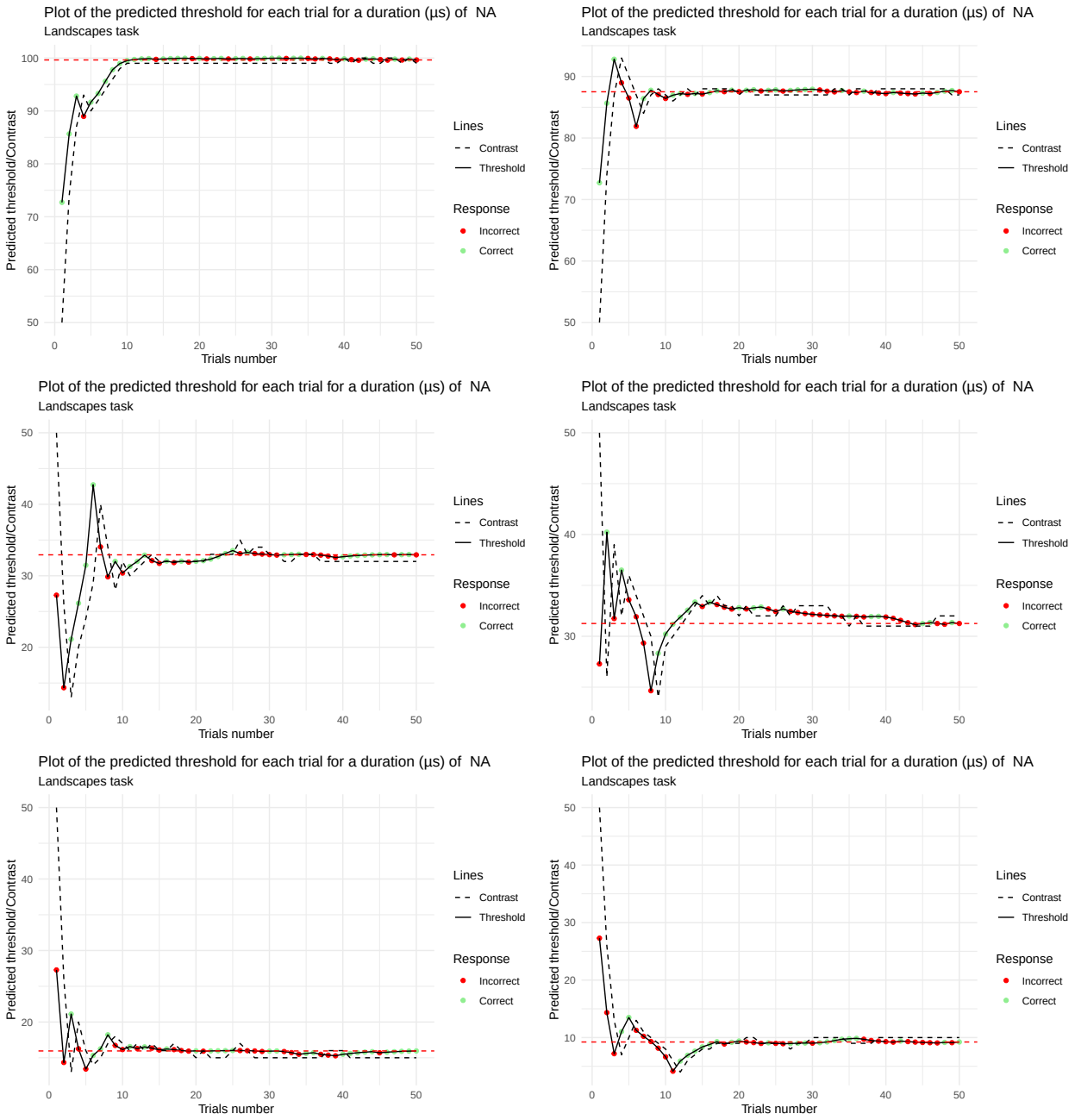

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

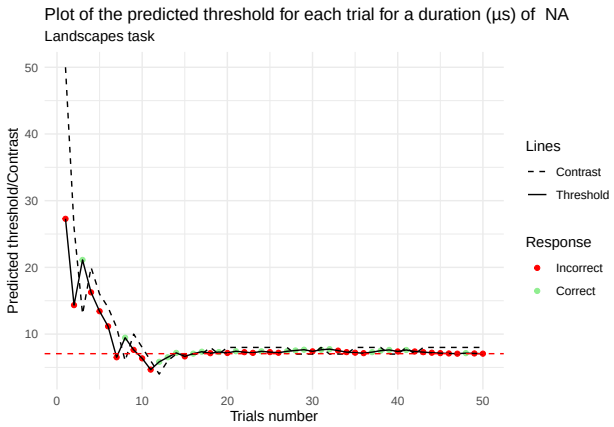

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

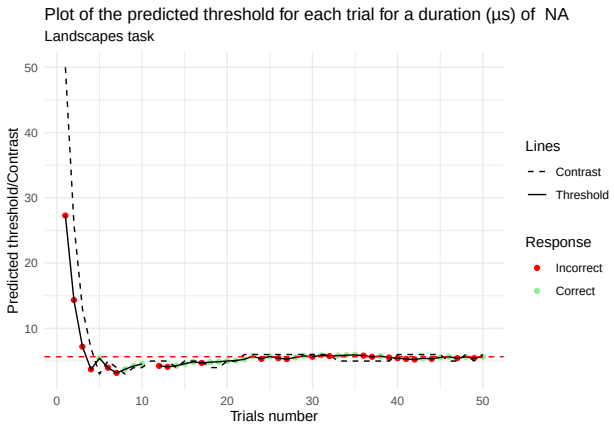

Plot of the predicted threshold for each trial for a duration (µs) of NA
Objects task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct


Plot of the predicted threshold for each trial for a duration (µs) of 500
Landscapes task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct


Plot of the predicted threshold for each trial for a duration (µs) of NA
Landscapes task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct

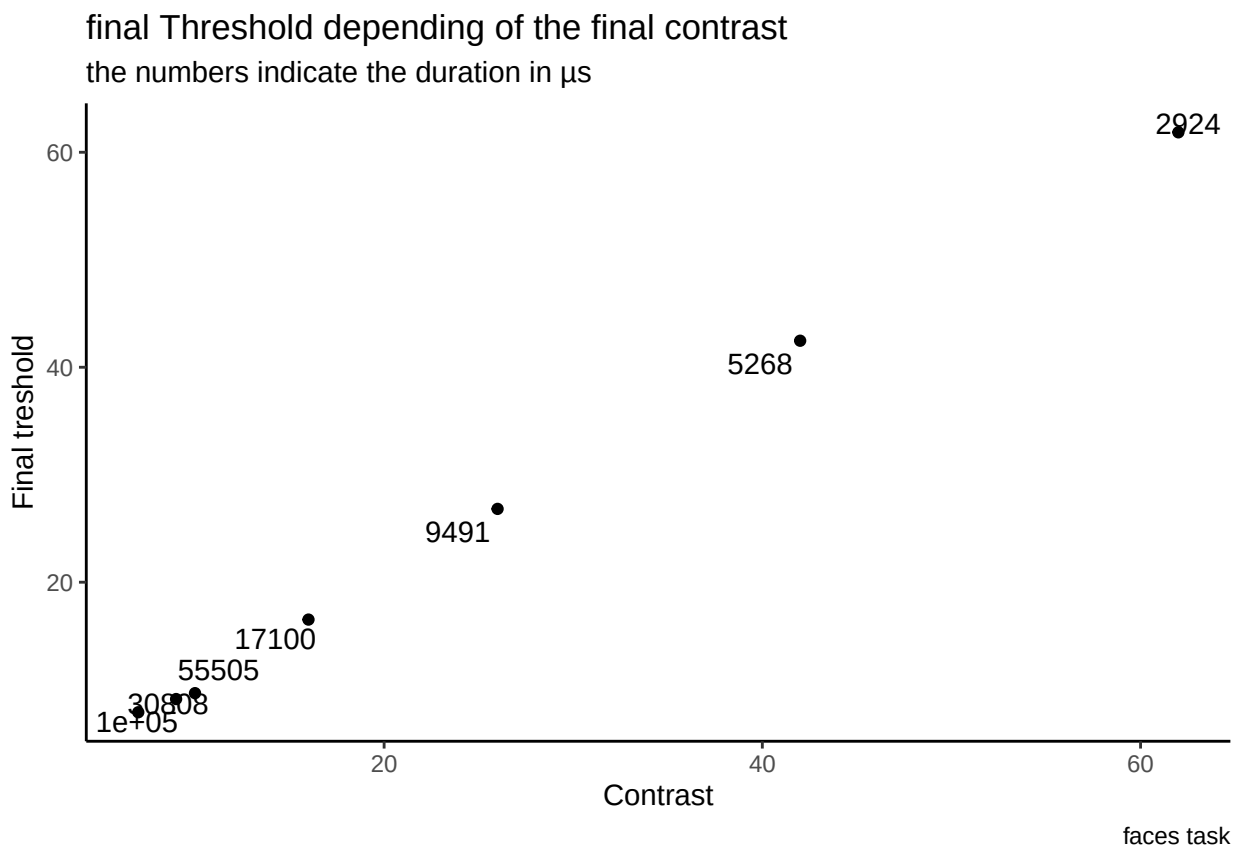

Plot of the predicted threshold for each trial for a duration (µs) of NA
Landscapes task
Predicted threshold/Contrast
Trials number
Lines
Contrast
Threshold
Response
Incorrect
Correct



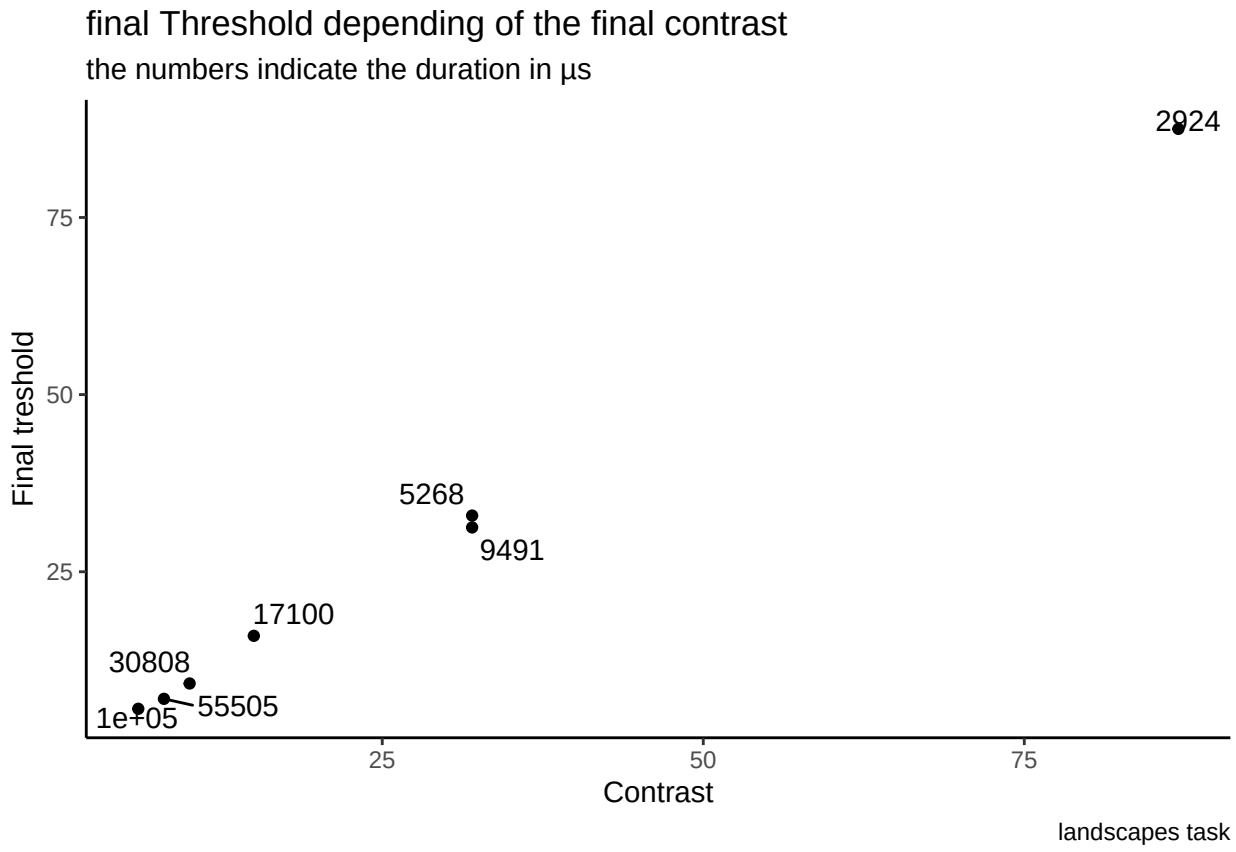



```r
final_thresholds_faces <- sapply(1:10, function(i) subsets_faces[[i]]$updated_threshold[50])
final_thresholds_objects <- sapply(1:10, function(i) subsets_objects[[i]]$updated_threshold[50])
final_thresholds_landscapes <- sapply(1:10, function(i) subsets_landscapes[[i]]$updated_threshold[50])


final_contrasts_faces <- sapply(1:10, function(i) subsets_faces[[i]]$contrast_test[50])
final_contrasts_objects <- sapply(1:10, function(i) subsets_objects[[i]]$contrast_test[50])
final_contrasts_landscapes <- sapply(1:10, function(i) subsets_landscapes[[i]]$contrast_test[50])
DurationF <- c(500, 901, 1623, 2924, 5268, 9491, 17100, 30808, 55505, 1e+05)


data_faces <- data.frame(final_thresholds_faces,final_contrasts_faces,DurationF)
Fil_data_faces <- subset(data_faces, final_thresholds_faces < 99)

data_objects <- data.frame(final_thresholds_objects,final_contrasts_objects,DurationF)
Fil_data_objects <- subset(data_objects, final_thresholds_faces < 99)

data_landscapes <- data.frame(final_thresholds_landscapes,final_contrasts_landscapes,DurationF)
Fil_data_landscapes <- subset(data_landscapes, final_thresholds_landscapes < 99)

inverse_relationship_faces <- ggplot(data = Fil_data_faces, aes(final_contrasts_faces, final_thresholds
  labs(title = "final Threshold depending of the final contrast",
       subtitle = "the numbers indicate the duration in µs" ,
       x = "Contrast",
       y = "Final treshold",
       caption = "faces task")

inverse_relationship_objects<- ggplot(data = Fil_data_objects, aes(final_contrasts_objects, final_thresh
  labs(title = "final Threshold depending of the final contrast",
       subtitle = "the numbers indicate the duration in µs" ,
       x = "Contrast",
       y = "Final treshold",
       caption = "objects task")

inverse_relationship_landscapes <- ggplot(data = Fil_data_landscapes, aes(final_contrasts_landscapes, fi
  labs(title = "final Threshold depending of the final contrast",
       subtitle = "the numbers indicate the duration in µs" ,
       x = "Contrast",
       y = "Final treshold",
       caption = "landscapes task")
```

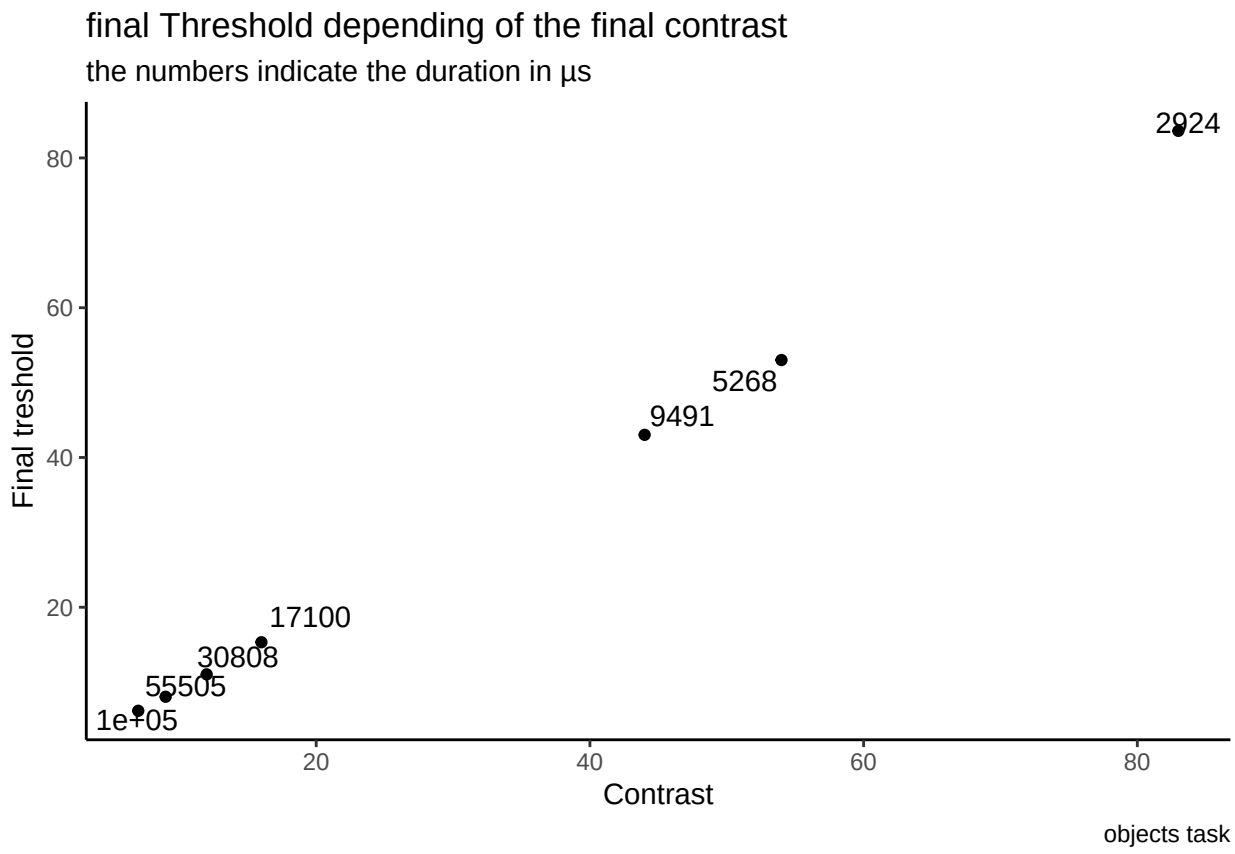
```
inverse_relationship_faces
```



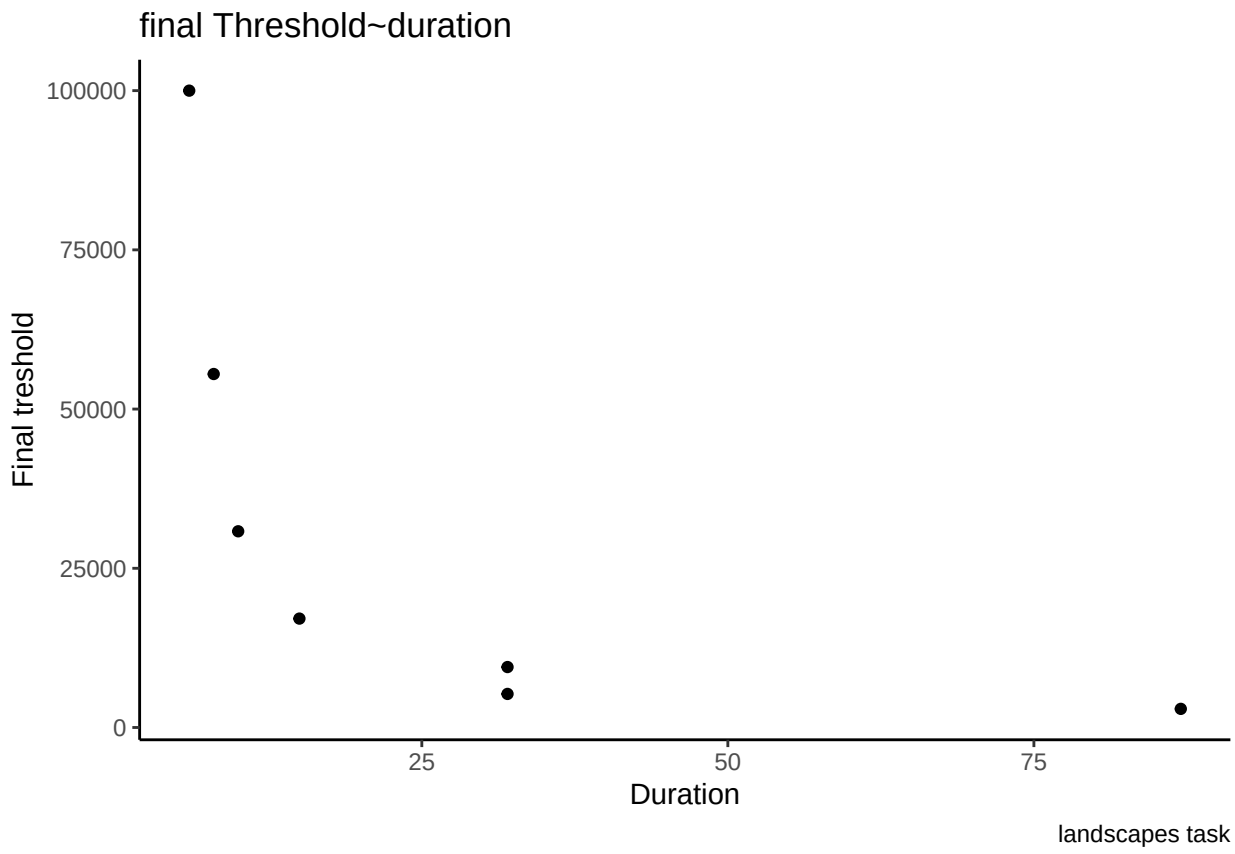

```
inverse_relationship_landscapes
```



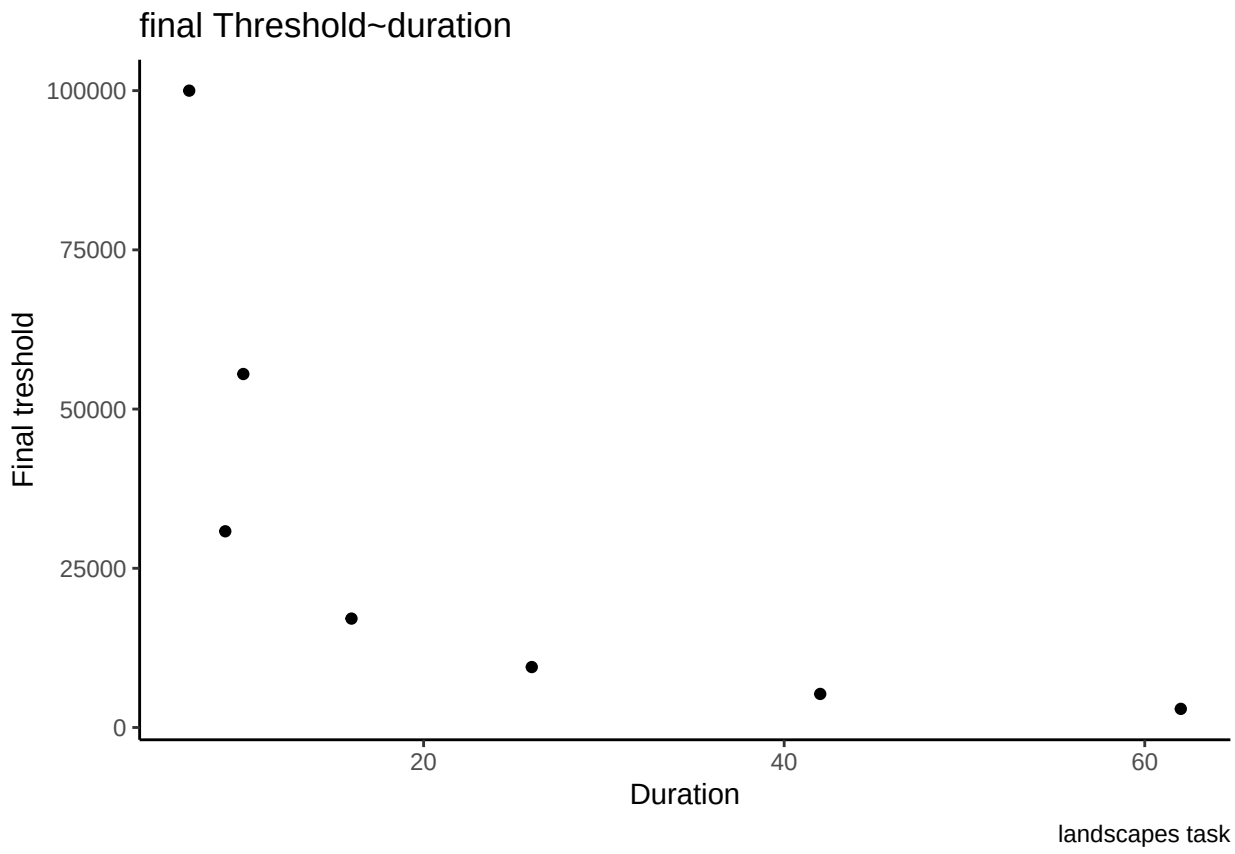

```
inverse_relationship_objects
```




```
duration_contrast_l <- ggplot(data = Fil_data_landscapes, aes(final_contrasts_landscapes, DurationF))  +
  labs(title = "final Threshold~duration",
       x = "Duration",
       y = "Final treshold",
       caption = "landscapes task")

duration_contrast_f <- ggplot(data = Fil_data_faces, aes(final_contrasts_faces, DurationF))  + geom_poi
  labs(title = "final Threshold~duration",
       x = "Duration",
       y = "Final treshold",
       caption = "landscapes task")

duration_contrast_l
```



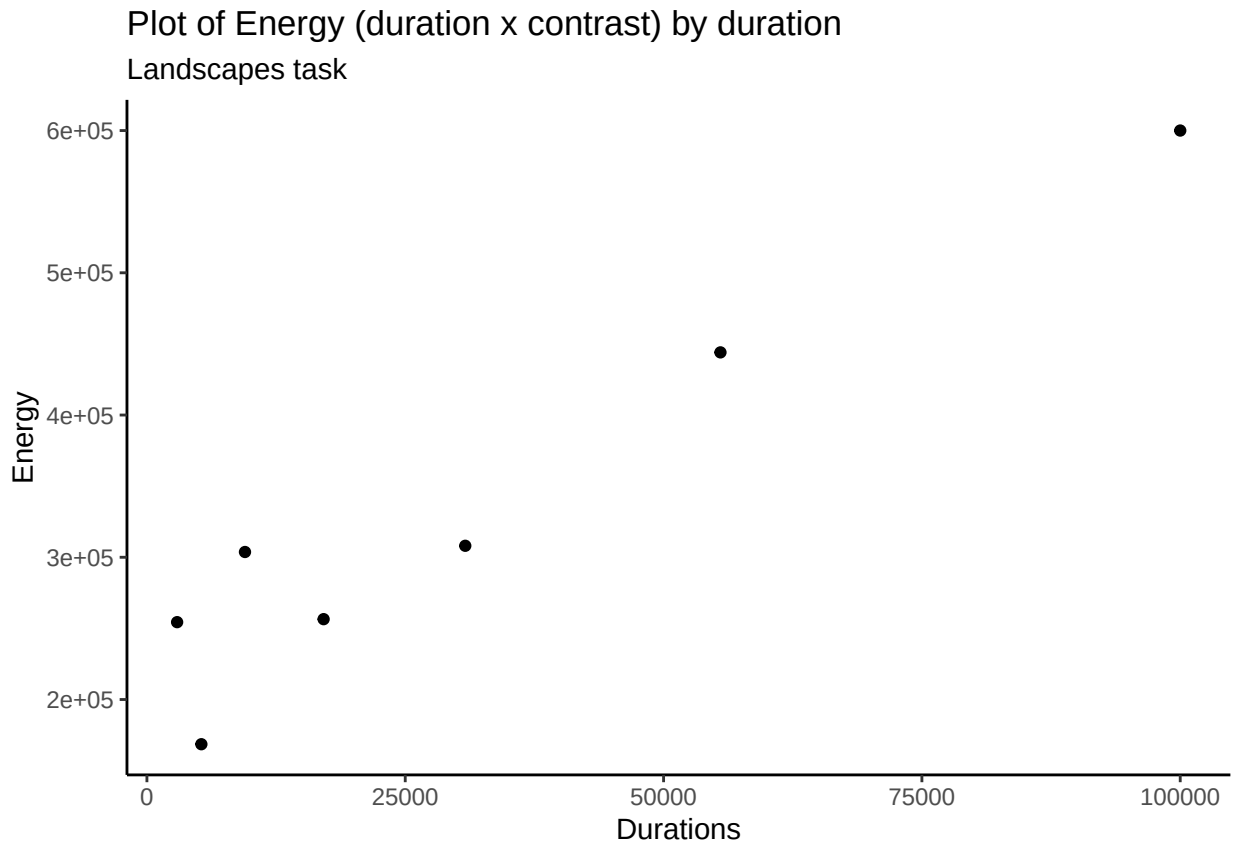

```
duration_contrast_f
```



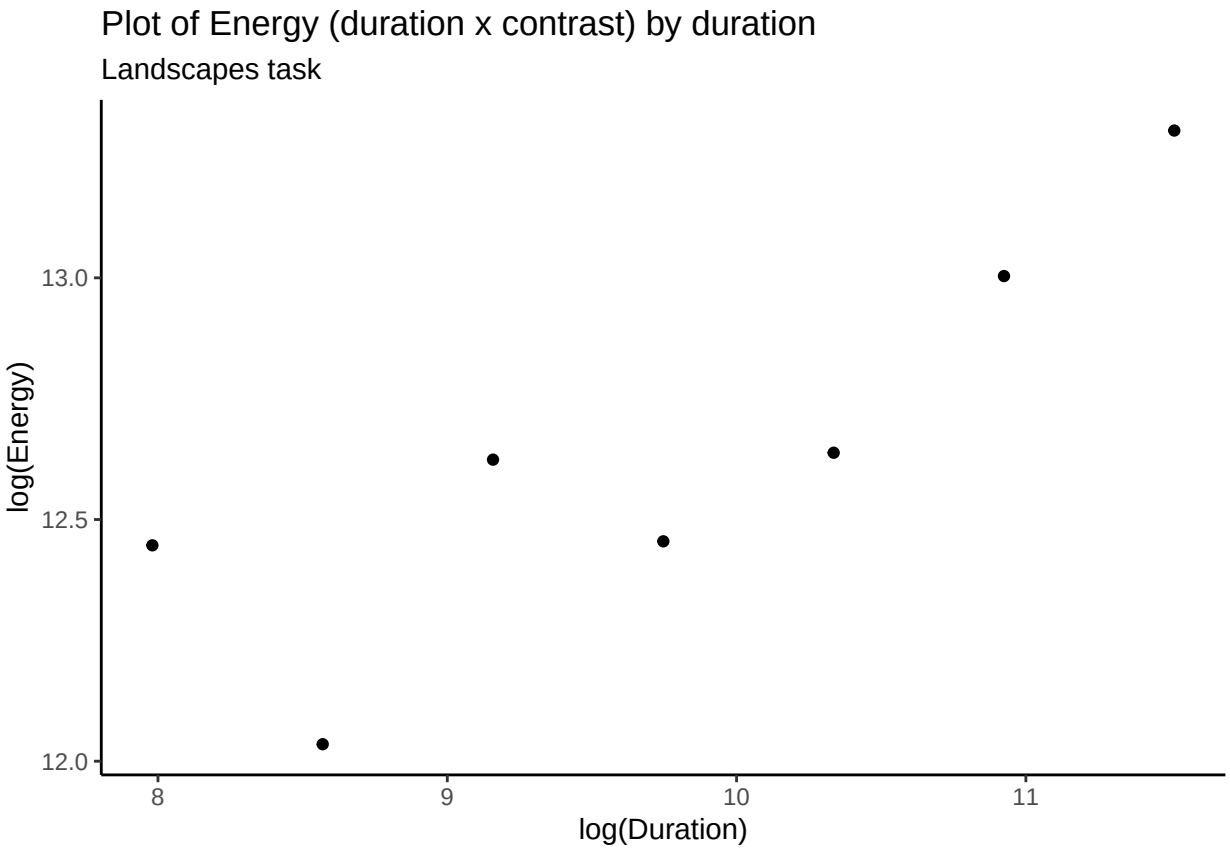

```
head(Fil_data_faces)
```

```
##   final_thresholds_faces final_contrasts_faces DurationF
## 4              61.855556                    62      2924
## 5              42.467453                    42      5268
## 6              26.821889                    26      9491
## 7              16.524498                    16     17100
## 8               9.130605                     9     30808
## 9               9.679484                    10     55505
```

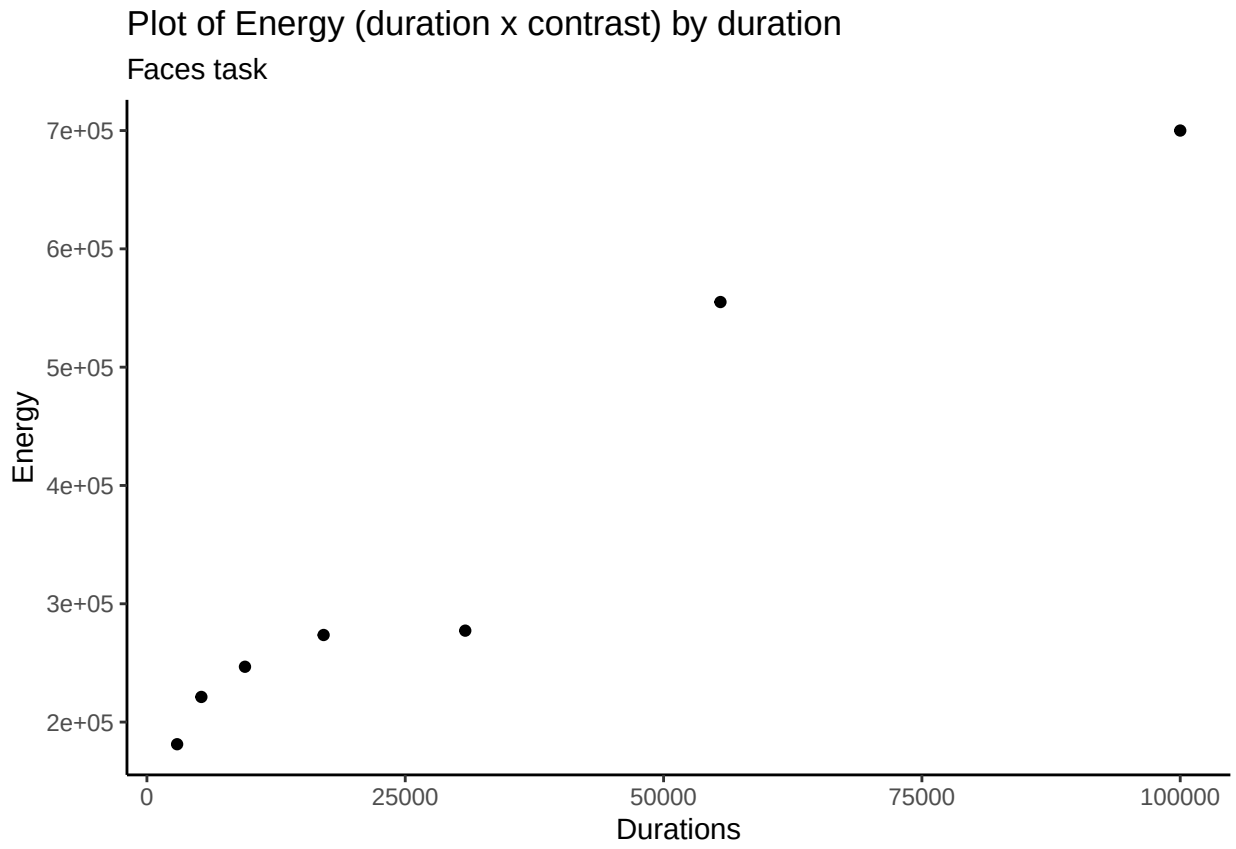
```
Energy_duration_plot_l <- ggplot(Fil_data_landscapes, aes(x = DurationF, y = final_contrasts_landscapes

LogEnergy_Logduration_plot_l <- ggplot(Fil_data_landscapes, aes(x = log(DurationF), y = log(final_contra

Energy_duration_plot_l
```



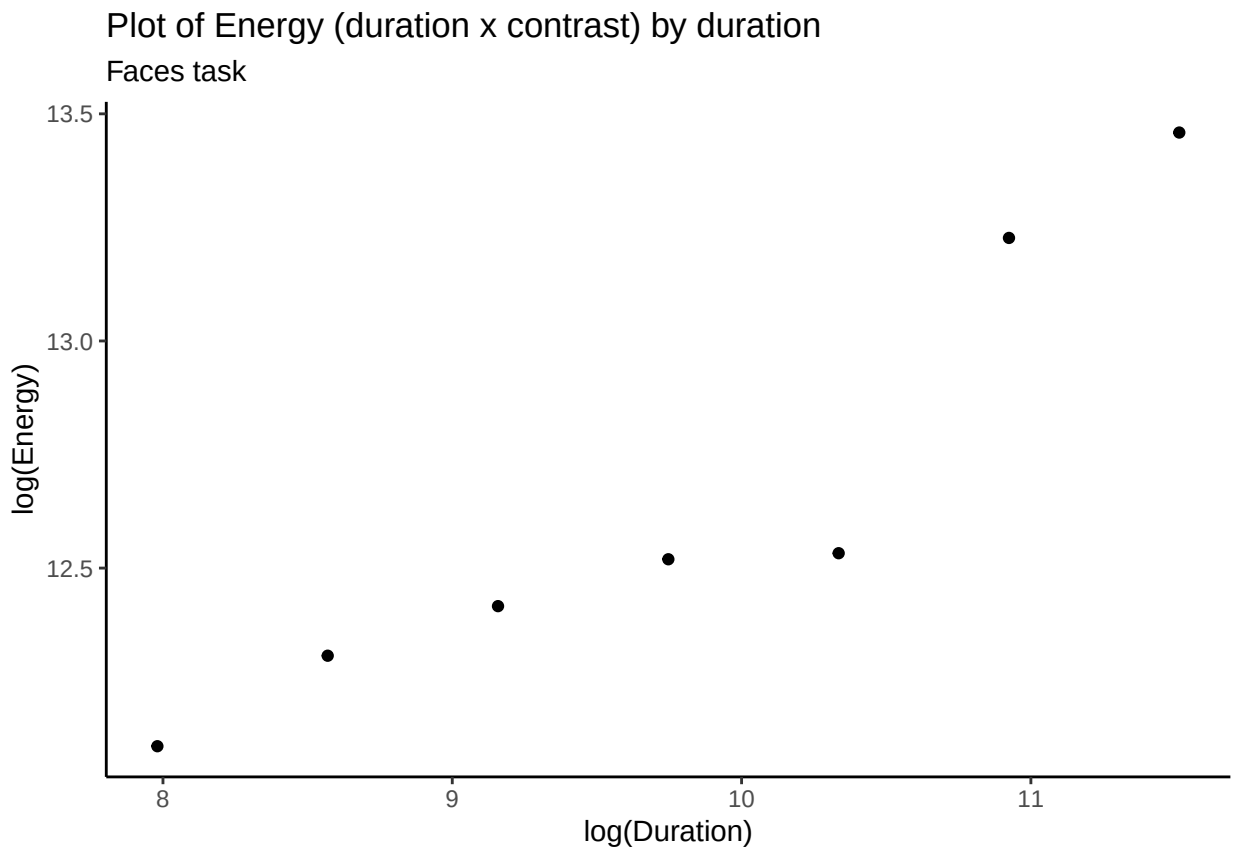

```
LogEnergy_Logduration_plot_l
```



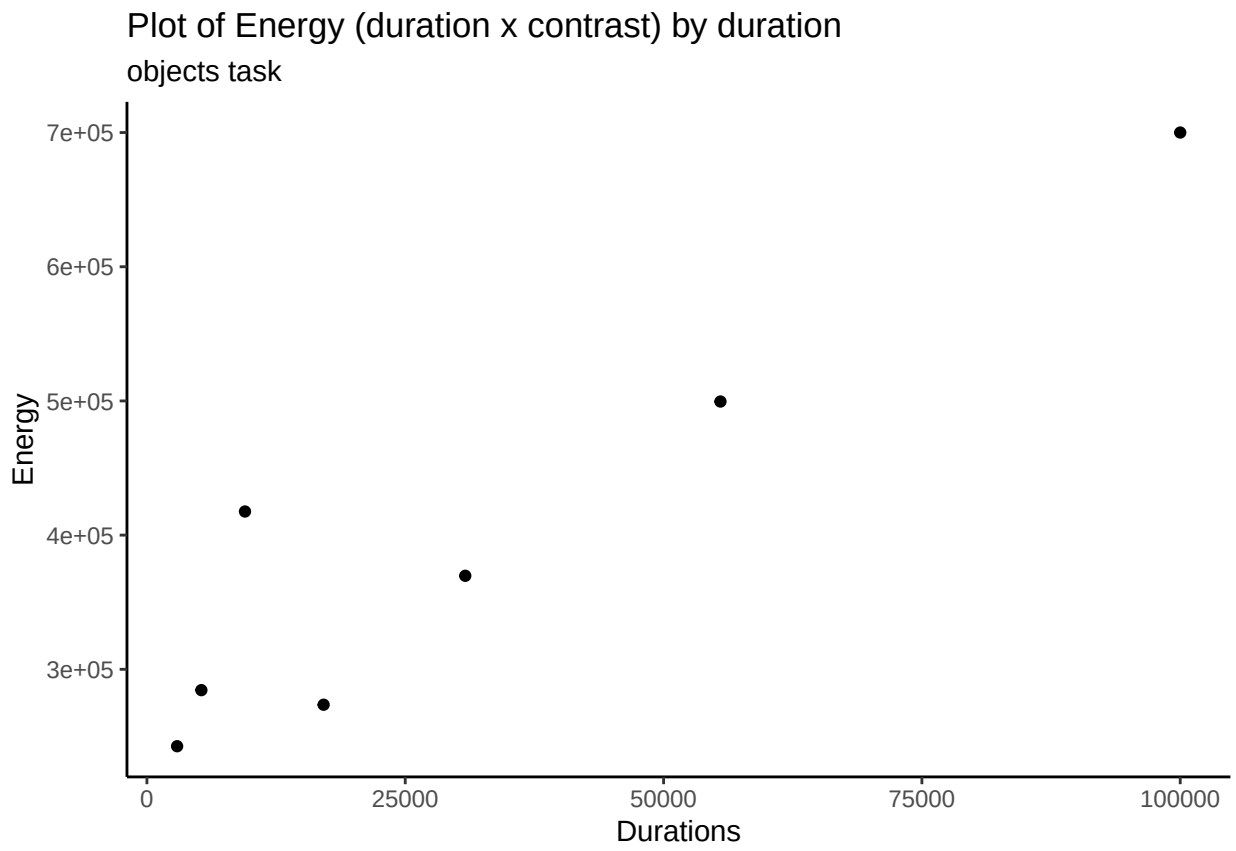

```
Energy_duration_plot_f <- ggplot(Fil_data_faces, aes(x = DurationF, y = final_contrasts_faces*DurationF)

LogEnergy_Logduration_plot_f <- ggplot(Fil_data_faces, aes(x = log(DurationF), y = log(final_contrasts_

Energy_duration_plot_f
```



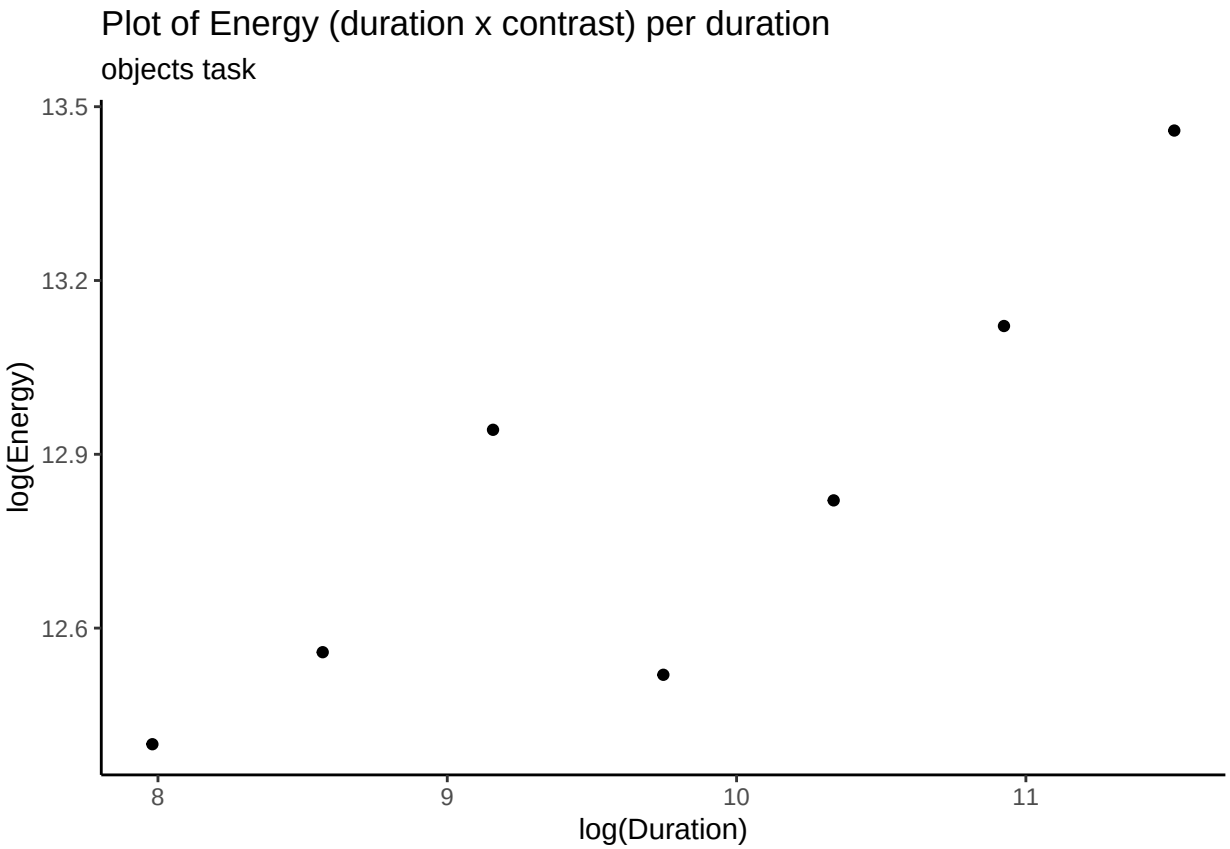

```
LogEnergy_Logduration_plot_f
```




```
Energy_duration_plot_o <- ggplot(Fil_data_objects, aes(x = DurationF, y = final_contrasts_objects*Durati

LogEnergy_Logduration_plot_o <- ggplot(Fil_data_objects, aes(x = log(DurationF), y = log(final_contrasts

Energy_duration_plot_o
```




```
LogEnergy_Logduration_plot_o
```


Plot of Energy (duration x contrast) per duration
objects task
13.5
13.2
12.9
12.6
log(Energy)
8
9
10
11
log(Duration)